IS 11432 (2002): Terms and Definitions of Dimensions of Two Wheeled Motor Vehicles [TED 4: Automotive Braking Systems]

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IS 11432 : 2002
(Superseding IS 9727 : 1981
and IS 11571 : 1986)

भारतीय मानक

दुपहिया मोटर वाहनों के मापों सम्बन्धी शब्द और परिभाषाएँ

(पहला पुनरीक्षण)

Indian Standard

TERMS AND DEFINITIONS OF DIMENSIONS OF TWO WHEELED MOTOR VEHICLES

(First Revision)

ICS 43.140; 01.040.43

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 2002

Price Group 4

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Basic Standards Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first published in 1986 covering the terms and definitions associated with dimensions of motorcycles only. In this revision, the terms and definitions of dimensions of 'Mopeds' and 'Scooters', which were covered separately under IS 9727 : 1981 and IS 11571 : 1986 respectively, have also been amalgamated in this standard. Subsequently IS 9727 : 1981 and IS 11571 : 1986 stand withdrawn.

In the preparation of this Indian Standard, considerable assistance has been derived from ISO 6725-1981 'Road vehicle — Dimensions of two wheeled mopeds and motorcycles — Terms and definitions', issued by the International Organization for Standardization (ISO).

The composition of the Committee responsible for formulation of this standard is given in Annex A.

Indian Standard

TERMS AND DEFINITIONS OF DIMENSIONS OF TWO WHEELED MOTOR VEHICLES

(First Revision)

1 SCOPE

This standard defines the terms relating to dimensions of two wheeled motor vehicles. It does not cover the following vehicles:

a) Vehicles with a maximum design speed not exceeding 6 km/h;

b) Vehicles intended for pedestrian control; and

c) Vehicles intended for use by the physically handicapped.

1.1 It does not deal with the methods of measurement, the units used in reporting the results, the accuracy required or with the order of the magnitude of the dimensions defined.

2 REFERENCE

The following Indian Standard contains provisions which, through reference in this text, constitutes provision of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
11422 : 2001	Terms and definitions of weights of two wheeled motor vehicles (*first revision*)

3 GENERAL CONDITIONS

3.1 The following conditions shall apply, unless otherwise stated:

a) the vehicle is stationary and vertical, with the supporting surface horizontal, and its wheels are in position corresponding to movement in a straight line;

b) both wheels of the vehicle are resting on the ground;

c) the weight of the vehicle is in the kerb condition as per IS 11422;

d) the tyres are inflated to the pressure recommended by the manufacturer corresponding to the gross vehicle weight;

e) the vehicle shall be representative of production series and normally equipped; and

f) the figures of the vehicle indicate typical two wheeler. The definitions are applicable to other types of two wheelers also.

3.2 Coordinates (*see* Fig. 1)

a) The planes of reference constitute a three-dimensional orthogonal system *X*, *Y*, *Z* where:
X—designates the horizontal plane;
Y—designates the vertical plane; and
Z—designates the plane perpendicular to *X* and *Y*.

b) The expression 'mid-plane of the wheel' designates the plane equidistant from the inner edges of the rim.

c) The expression 'centre of the wheel' designates the part of inter-section of the mid-plane of the wheel and the axis of rotation of the wheel.

d) Lengths and widths are measured in the horizontal plane *X*, heights in vertical plane *Z*.

3.3 Longitudinal Median Plane (Plane *Y*) (*see* Fig. 2)

The vertical plane which bisects the vehicle along the continuation of the mid-plane of the rear wheel.

4 TERMS AND DEFINITIONS OF DIMENSIONS

4.1 Length (*see* Fig. 3)

Distance '*l*' between two vertical planes perpendicular to the longitudinal median plane and touching respectively the front and rear of the vehicle. All parts of the vehicle, including any parts projecting to front or rear are contained between these two planes.

4.2 Width (*see* Fig. 4)

Distance '*b*' between two planes parallel to the longitudinal median plane and touching the vehicle on either side of this plane. All parts of the vehicle including any lateral projections of fixed parts, are contained between these two planes, except the rear view mirrors.

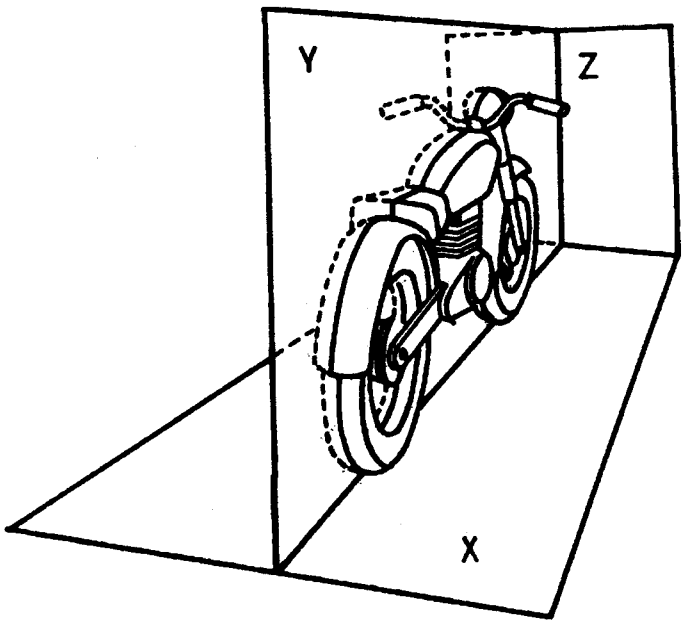

FIG. 1

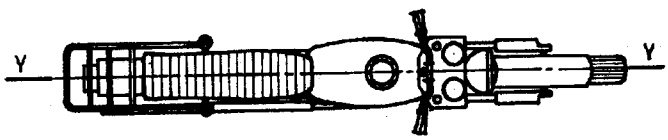

FIG. 2

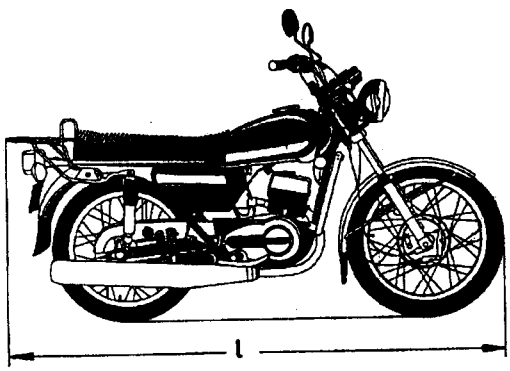

FIG. 3

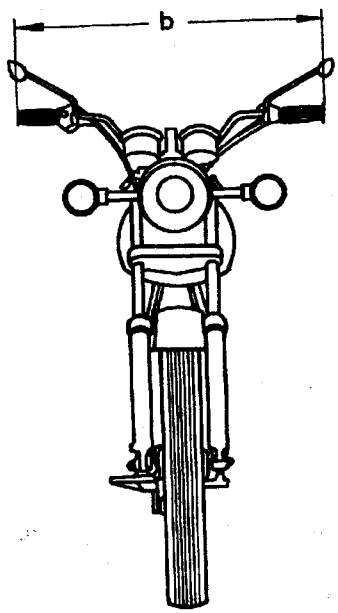

FIG. 4

4.3 Height (*see* Fig. 5)

Distance 'h' between the supporting surface and a horizontal plane touching the top most part of a vehicle. All fixed parts of the vehicle are contained between these two planes, except the rear view mirror.

4.3.1 *Saddle Height (see Fig. 6)*

Height 'h_S' between the top surface of the driver's seat and the horizontal plane touching the ground.

4.3.2 *Residual Vertical Travel (see Fig. 7)*

The vertical displacement of either the front wheel (t_f) or rear wheel (t_r) in relation to the suspended part of

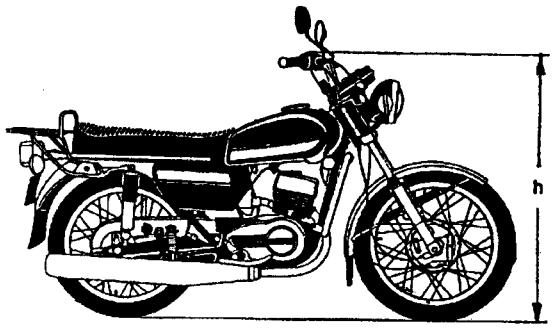

FIG. 5

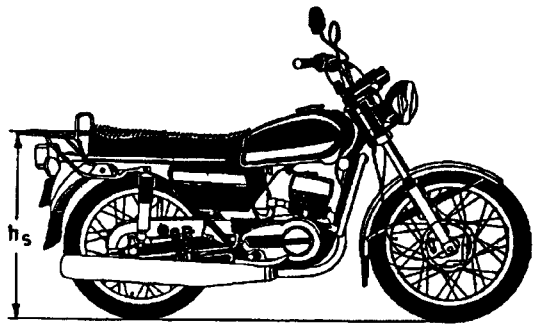

FIG. 6

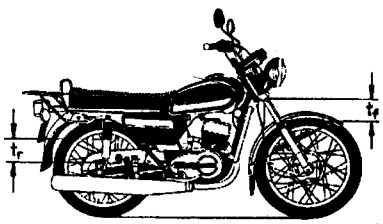

FIG. 7

the vehicle from the position corresponding to the weight distributed on that wheel when loaded in accordance with gross vehicle weight, to the position in which any additional vertical travel is impossible.

4.4 Wheel Base (*see* Fig. 8)

Distance 'l_W' between the perpendicular plane (Z) projected through the centres of the wheels on to the supporting surface.

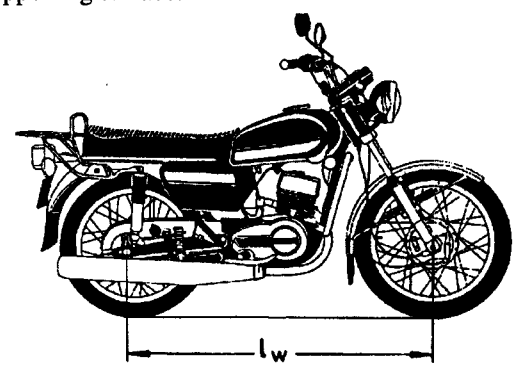

FIG. 8

4.5 Front Overhang (*see* Fig. 9)

Distance 'l_f' between the perpendicular plane (Z) passing through the centre of the front wheel and the foremost point of the vehicle, taking into consideration, any part rigidly attached to the vehicle.

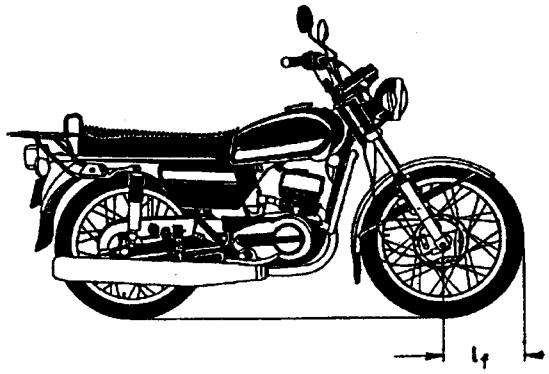

FIG. 9

4.6 Rear Overhang (*see* Fig. 10)

Distance 'l_r' between the perpendicular plane (Z) passing through the centre of the rear wheel and the rearmost point of the vehicle, taking into consideration, any part rigidly attached to the vehicle.

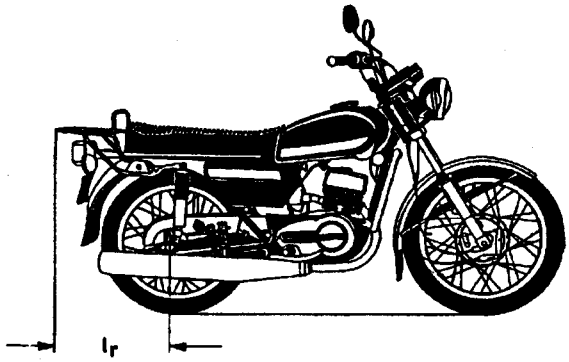

FIG. 10

4.7 Ground Clearance (*see* Fig. 11)

Distance 'h_g' between the supporting surface and the lowest point of the vehicle lying within the wheel base, except for the front and rear wheels. The vehicle shall be loaded to the condition of gross vehicle weight. In case of vehicles having pedals, the lowest position of pedals is excluded.

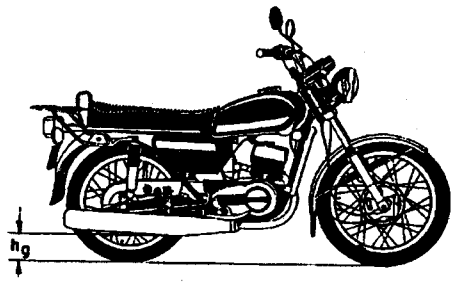

FIG. 11

4.8 Pedal Clearance (*see* Fig. 12)

In the case of two wheelers equipped with pedals, the distance '*h*' between the supporting surface and the lowest point of the pedal measured when the pedal crank is perpendicular to the supporting surface and the pedal is in its lowest position. The vehicle shall be loaded to the condition of gross vehicle weight.

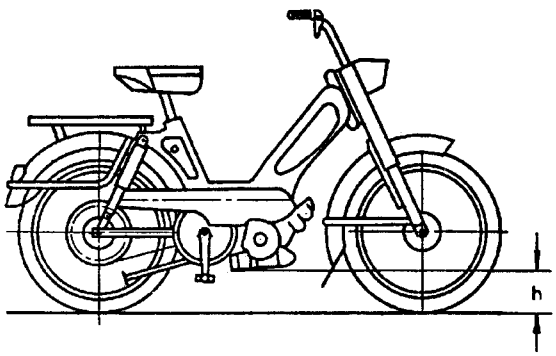

FIG. 12

4.9 Pedal Distance (*see* Fig. 13)

It is the distance '*h*' between the axis of the pedal and top surface of the saddle taken on a vertical plane, saddle being at the lowest position of its adjustment, if any, and the vehicle shall be loaded to the condition of gross vehicle weight.

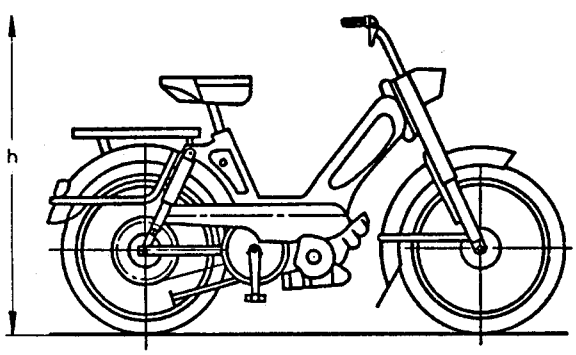

FIG. 13

4.10 Ramp Angle (*see* Fig. 14)

The minimum acute angle 'α_r' between two planes perpendicular to the longitudinal median plane tangential, respectively, to the front and rear wheels and intersecting at a line touching the lower part of the vehicle, outside these wheels and within the wheel base the vehicle being loaded to the condition of gross vehicle weight. This angle defines the largest ramp over which the vehicle can move.

4.11 Approach Angle (*see* Fig. 15)

The greatest angle 'α_a' between the supporting surface and plane tangential to the radius of the front tyre and perpendicular to the longitudinal median plane so that no part of, or any part rigidly attached to the vehicle lies below this plane. The vehicle lies below this plane. The vehicle being loaded to the condition of gross vehicle weight.

4.12 Departure Angle (*see* Fig. 16)

The greatest angle 'α_d' between the supporting surface and a plane tangential to the radius of the rear tyre and perpendicular to the longitudinal median plane, so that no part of, or any part rigidly attached to the vehicle lies below this plane (*see* Fig. 16). The vehicle being loaded to the condition of gross vehicle weight.

4.13 Trail [*see* Fig. 17 (a)]

The distance 'l_c' between points *P* and *Q*. Point *P* being intersection of plane perpendicular to plane *Y*, passing through the steering axis of fork and supporting surface *X*. Point *Q* being intersection of plane *Z* passing the centre of front wheel and the supporting surface *X*. The points *P* and *Q* lie on longitudinal median plane of the vehicle. The trail is negative when *Q* is ahead of *P* in the driving direction and positive when *Q* is at the rear of *P*.

4.14 Trail (Castor) Angle [*see* Fig. 17 (b)]

The acute angle 'θ' formed by the vertical plane and the steering axis of the fork when projected on the plane *Y*.

4.15 Turning Circle Diameter (*see* Fig. 18)

Diameter d_1 of the circle, circumscribing the extension of the mid-plane of the steered (front) wheel on the supporting surface (the vehicle being upright and vertical, and the steered wheel being turned to full lock).

The smaller diameter d_2 of the circle, circumscribing the extension of the mid-plane of the non-steered (rear) wheel on the supporting surface is also of practical interest. Each vehicle has a left-hand and a right-hand turning circle.

4.16 Turning Clearance Circle Diameter (*see* Fig. 19)

Diameter measured with the vehicle upright and vertical, the steered (front) wheel being turned to full locks defined as follows.

The diameter d_1 of the largest circle projected on the supporting surface, beyond which all parts of the vehicle are located;

The diameter d_2 of the smallest circle projected on the supporting surface, within which all parts of vehicle are located.

Each vehicle has left-hand and right-hand turning clearance circles.

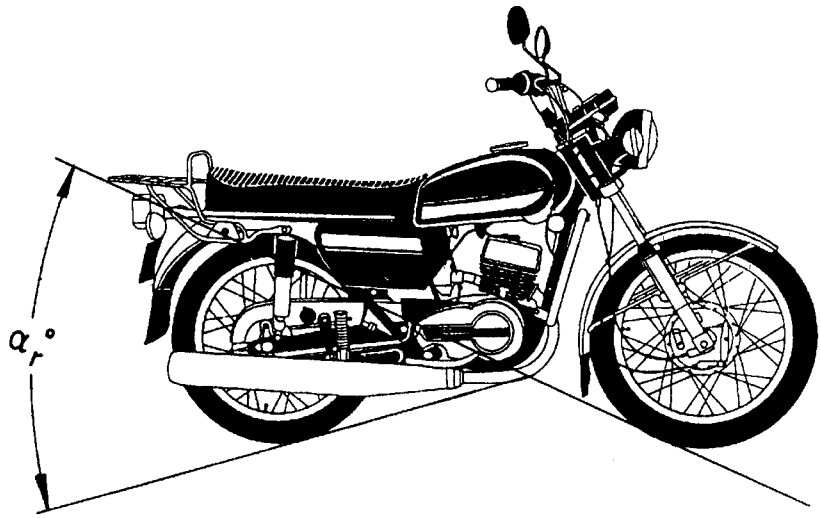

FIG. 14

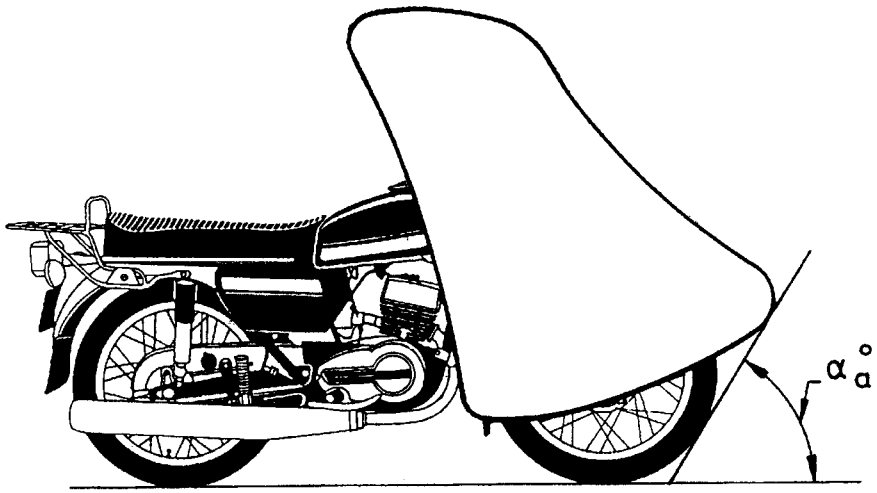

FIG. 15

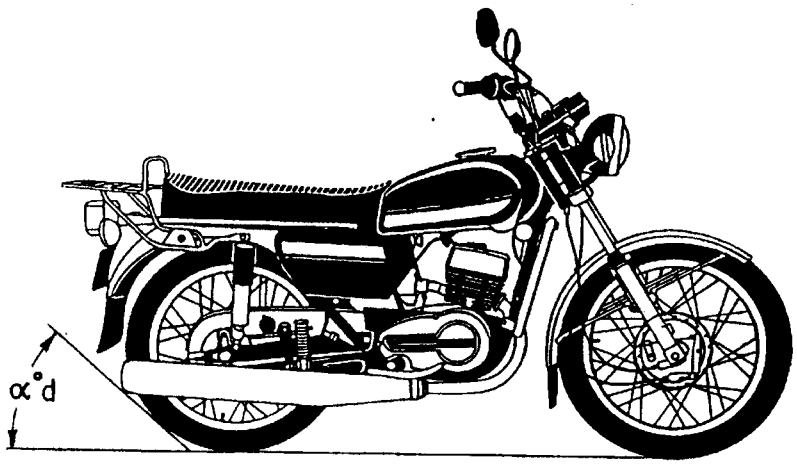

FIG. 16

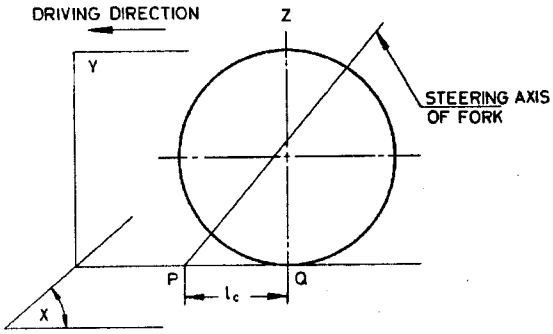

FIG. 17 (a)

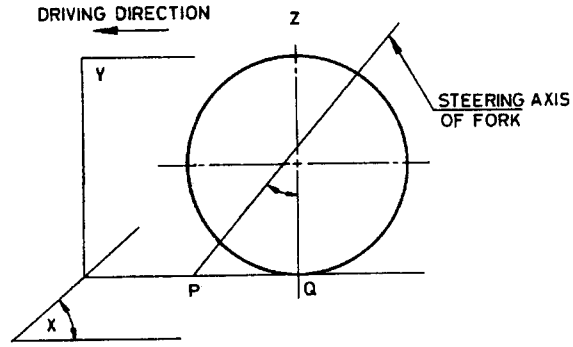

FIG. 17 (b)

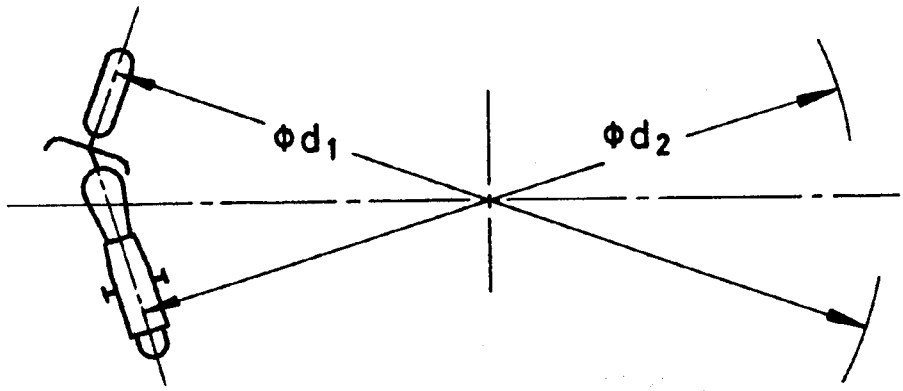

FIG. 18

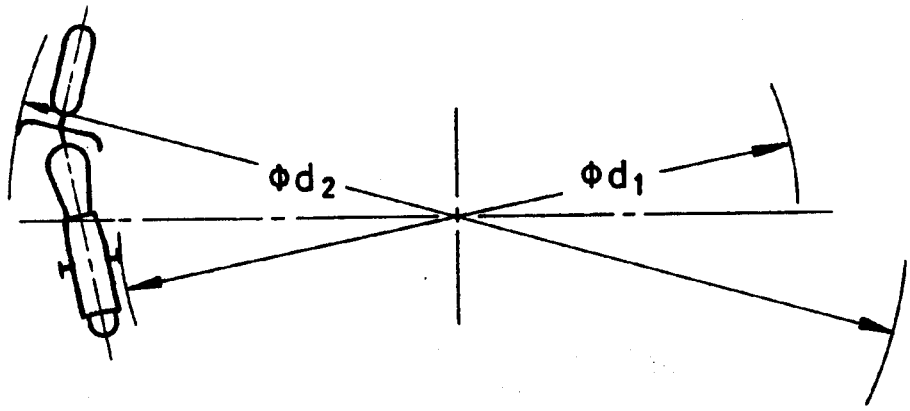

FIG. 19

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Automotive Basic Standards Sectional Committee, TED 1

Organization	*Representative(s)*
Automotive Research Association of India, Pune	SHRI B. BHANOT (*Chairman*) SHRI U. A. KULKARNI (*Alternate* I) SHRI S. S. SANDHU (*Alternate* II)
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Member-Secretary
SHRI A. K. NAGPAL
Director (TED), BIS

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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